

Peer Review of Three Lakes Water Quality and Hydrologic Models in its application to spatially and temporally represent the Three Lakes System and predict impacts of the alternatives to improvement of Grand Lake Clarity.

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Purpose: Provide a Review of the Three Lakes Water Quality and Hydrologic Models.

Background and Scope: The Three Lakes System, located in Grand County, Colorado is made up of Grand Lake, Shadow Mountain Reservoir, and Granby Reservoir. The Colorado-Big Thompson Project, which is owned by Reclamation and operated jointly with Northern Colorado Water Conservancy District, collects water from the headwaters of the Colorado River and uses the Three Lakes System as a conveyance system, moving an average of 230,000 acre-feet of water from the western slope to the eastern slope of Colorado annually. Water quality/clarity in the Three Lakes has been a local concern for decades. In 2016, the State of Colorado Water Quality Control Commission conditionally approved a narrative water quality standard to improve Grand Lake water clarity without adverse water quality effects on other water bodies or adverse yield effects on Reclamation's Colorado-Big Thompson (C-BT) Project while remaining consistent with primary project purposes outlined in Senate Document 80, 75th Congress, First Session, June 15, 1937.

Since the early 2000s, system-wide modeling, including multiple model enhancements, have taken place, attempting to clarify issues of water quality in the Three Lakes system and Grand Lake clarity. The current version of the water quality model was developed in CD-QUAL-W2 version 3.72 and is the Three Lakes Water-Quality Model-W2, version 1.0 (3LWQM). The 3LWQM requires output from an independent model, the C-BT Planning & Operations Model (C-BT P&OM). C-BT P&OM was developed using Riverware version 6.8 and provides regulated flows into and out of the 3LWQM. Accordingly, the integrated operational 3LWQM will be used to evaluate adaptive management strategies for C-BT operations and assist in the analysis of alternatives to address improvement of Grand Lake water clarity.

The science informing the Grand Lake Clarity Project is subject to unbiased peer review. Of specific concern is the adequacy of the modeling to spatially and temporally represent the Three Lakes System and predict impacts of the alternatives to improvement of Grand Lake water clarity. These impacts will inform the potential design and economic analysis defining the range of alternatives for improving water clarity in Grand Lake.

The decision is very controversial, has significant interagency interest and will be precedent setting for Reclamation. This independent review will follow Reclamation's policy "Peer Review CMP P14.

Expected Timing: FY2018 Initiation. Estimated completion by July 31, 2018.

Type of Review: Panel

Public Comment: No public comment. However, any decisions or permanent changes in C-BT system operations based on the outcome of these results would be subject to NEPA requirements, which does allow for public review and comment.

Number of Reviewers: Anticipate 6 reviewers.

Expertise necessary: The peer reviewers must have experience and expertise in limnology, water quality, nutrient loading, and CE-QUAL-W2 Modeling.

Reviewer Selection Process: Reclamation will work through a Cooperative Ecosystems Studies Unit Agreement (CESU) with a Principal Investigator (PI) from a participating accredited university to form a review panel. The PI will be responsible for identifying reviewers that can meet the Peer Review Scope and meet the expertise qualifications identified above. The PI will also be responsible for assuring that peer reviews do not have a conflict of interest. Reclamation will have final approval of the reviewers.

Impact of Dissemination: Under Reclamation policy CMP P-14 Peer Review of Scientific Information and Assessments in fulfillment of the Final Information Quality Bulletin for Peer Review (70 FR 2664-2677) and implementation of the Information Quality Act (Pub. L. 106-554) the science informing Grand Lake Clarity is determined to be a highly influential scientific assessment.